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January, 1962 *Approx. 288 pp.* *Paperbound* *Text price: $4.95*

Laboratory Handbook of Toxic Agents

Edited by C. H. Gray, *King's College Hospital Medical School, University of London*

A compact guide to toxic effects and immediate steps for first aid. Offers specific information about the hazards associated with the use of familiar chemicals, their acute chronic and toxic effects, and remedies in case of exposure or mistaken use. Arranged alphabetically, the basic subject matter is made instantly accessible without a separate index.

1961 *184 pp.* *Trade price: $5.00*

Inorganic Chemistry of Qualitative Analysis

by Alan F. Clifford, *Purdue University*

Uses the relationships of qualitative analysis to teach the chemistry of the periodic table in a systematic fashion, showing how the analytical scheme is built on and reflects the systematics of the periodic table. Thus the "solubility rules" are expanded and shown to be examples of trends within the periodic table.

1961 *515 pp.* *Text price: $6.95*

Experimental Nuclear Chemistry

by Gregory R. Choppin, *Florida State University*

This text is designed to help teach the techniques and necessary basic theory for utilization of radioisotopes in research and experimentation. A variety of experiments and techniques are included with a discussion of the theory behind each.

1961 *226 pp.* *Text price: $6.95*

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By Sidney Golden, *Brandeis University*

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By Terrell L. Hill, *University of Oregon*

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508 pp, 97 illus, 1960—$9.75

CHEMICAL INSTRUMENTATION: A Systematic Approach to Instrumental Analysis

By Howard A. Strobel, *Duke University*

This text for a course of up to two semesters offers a systematic approach to the basic principles common to all methods and types of instruments and maintains a balance between physical theory and design on one hand, and chemical procedure and theory on the other. In each chapter are extensive references, plus well-chosen questions and problems dealing with the material of the chapter.

"This book is a refreshing departure from the usual loosely organized texts on the subject in that it treats instrumentation as a science in itself built on the foundations of physics, physical chemistry, and engineering. Amply illustrated with well-conceived figures." (Talanta)

653 pp, 373 illus, 1960—$9.75

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BOOK REVIEWS

Anorganisches Grundpraktikum

Carl Mahr, University of Marburg, Germany. 2nd ed. Verlag Chemie, GMBH, Weinheim/Bergstr., 1961. xiv + 421 pp. Figs. and tables. 15.5 × 23 cm. Paperbound, $7, Hard cover, $7.25.

This laboratory manual for first year chemistry in German universities is a continuation of Professor Mahr's attempts to introduce a change in the teaching of laboratory practice. The purely qualitative aspects have been de-emphasized, modern advances in techniques and measurements have been introduced. The author hopes that this will lead to shortening of the time required for the fulfillment of the degree requirements.

The experiments are grouped in sections designed to take about 3 to 4 hours of laboratory work. Each of these describes experiments demonstrating a particular technique.

The laboratory course is divided into three main parts, the first one pertaining to Introductory Practices, the second to Reactions of the Elements and the third to Qualitative Analysis.

The first part of the Introductory Practice covers techniques and measurements; it includes experiments on heating, glass blowing, weighing, volume measurements, miscible and immiscible solvent solute systems, etc. It is pretty much similar to the introductory experiments, although a greater variety in the various types is given. The second part demonstrates techniques used in the separation of substances such as filtration, centrifugation, differential solubilities, distillation, sublimation, etc. The third part of this section pertains to the application of the fundamental laws of chemistry to aqueous solutions. Among the various topics discussed and demonstrated are measurements of conductivity, ionic mobility, *p*H, ionization constant, buffer solutions, solvation and complex ion formation, solubility products, red-ox potential and electrolysis and reaction rates and reaction kinetics. Many interesting experiments have been devised in most cases with very simple equipment.

Twenty-four half days of laboratory work are necessary for these experiments which would give six weeks with two full days per week.

The second main part covers in about 200 experiments the reactions and qualitative determinations of the metals and nonmetals. Techniques and principles demonstrated in the first part are applied.

The first section of this part deals with the reactions and identifications of elements and compounds of Group VII-B through III-B. Preparations of the elements and their compounds are included. A few experiments of this section are of the type given in American freshman laboratory manuals. A large variety of experiments involve most of the usual compounds of the groups. Many of these experiments are challenging to first

(*Continued on page A918*)

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PRINCIPLES AND PRACTICE OF ORGANIC CHEMISTRY

By Frederick G. Bordwell, Northwestern University

Here is the functional textbook that Chemistry instructors have been waiting for. Professor Bordwell, after nine years of classroom testing, has achieved total integration of functional classes by means of an organization based on structure and mechanistic reaction type. Three-dimensional structure receives particular attention. This book will prove a valuable addition to any chemistry library, in addition to being one of the most modern and effective texts available for classroom use.

April, 1962

ORGANIC CHEMISTRY LABORATORY OPERATIONS

By William B. Renfrow and Peter J. Hawkins, both of Oberlin College

This paperbound collection of experiments in organic chemistry stresses modern research methods. The exercises illustrate the techniques and basic principles of laboratory work, and are designed to accompany any standard text in the field. Qualitative and physical organic chemistry, and the design of experimental procedures receive particular attention. There is more material on qualitative organic analysis than in any comparable manual. The experiments have all been thoroughly tested under actual teaching conditions.

April, 1962

SEMIMICRO LABORATORY EXERCISES IN GENERAL CHEMISTRY, Third Edition

By J. Austin Burrows and Paul Arthur, both of Oklahoma State University, and Otto M. Smith, Kansas State Teacher's College

This outstanding laboratory manual for first year chemistry courses utilizes the more efficient and economical semimicro techniques for both quantitative and descriptive experiments. There are experiments in radioisotopes and modern applications of ion exchange, resins, paper chromatography, determination of ionization constants, and argentimetric titrations. Each experiment is accompanied by carefully prepared practice problems, tables of essential information and materials, and a complete list of reagents and necessary apparatus. The experiments can be used for both two and three-hour laboratory periods.

February, 1962

LABORATORY PRACTICE OF ORGANIC CHEMISTRY, Fourth Edition

By G. Ross Robertson and Thomas Jacobs, both of the University of California (Los Angeles)

The distinctive feature of this work is its extensive but informal treatment of the principles underlying laboratory practice. It encourages independent scientific thinking by emphasizing analytical experimentation and the preparation of chemical products in finished form. A "Library Problem" will assist the student in becoming aware of the writing skills necessary in the study of chemistry. The "Special Experiments" have been expanded, providing significant special problems for the second semester of a year course.

April, 1962

TEXTBOOK OF INORGANIC CHEMISTRY

By S. Young Tyree, University of North Carolina, and Kerro Knox, Bell Telephone Laboratories

Designed expressly for beginning courses in inorganic chemistry, this text requires no previous background in physical chemistry. Its overall view of the field highlights patterns of behavior among the elements. The material is organized according to groups of elements in the periodic table. For each element, the authors outline occurrence, history, preparation, physical properties, chemical properties and compounds. The new systematic nomenclature is employed throughout the text.

1961, 434 pages, $7.00

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year students such as those studying reaction kinetics, determination of coordination numbers, polymerization of phosphates, adsorption on Kieselguhr, Base-Antibase reactions. A few new techniques are introduced (such as paper chromatography) at appropriate places. The experiments in Group IV-b are restricted to those compounds considered primarily inorganic.

In the second section of this part the preparation and chemical properties of the metals and their compounds are combined with traditional H_2S separation scheme. New techniques such as Ion Exchange, Complexometry, etc., are presented for those compounds where their application is most appropriate. The author states that the purpose of the H_2S scheme is not to identify the components, but to separate them as pure compounds. Although this is stretching the point, the author does teach the student techniques necessary for success in trace analysis, radiochemical separations and preparation of pure compounds.

The last main part is devoted to qualitative analysis by micro and semimicro techniques. Its first section demonstrates the use of specific organic and inorganic reagents for metal ions and includes an introduction to spot plate techniques. The various types of reactions—salts, redox, complexation, etc., are described.

This is followed by an analytical scheme in an excellent condensed form. After a series of preliminary test-flame heating, the group separation involves among others the HNO_3 insoluble, HCl, reduction, thioacetamide, sulfate groups. The cations are identified by specific reagents, a short section on anions and insoluble substance identification is included. Short introductions to microscopic, trace and paper chromatic separation make up the rest of this part.

The author purposely does not discuss much of the theoretical aspects, but gives excellent references for these. The book should be of interest to American chemists because it demonstrates that German chemistry professors realize that changes in their beginning chemistry curriculum are long overdue. The reviewer also has found some of the sections of this book quite helpful.

HANS B. JONASSEN
Tulane University
New Orleans, Louisiana

Electronics for Spectroscopists

Edited by *C. G. Cannon*, British Nylon Spinners Ltd., Pontypool, England. Interscience Publishers, Inc., New York, 1960. viii + 333 pp. Figs. and tables. 15 × 22 cm. $9.50.

"Electronics for Spectroscopists" represents the proceedings of the 1949 and 1950 summer school courses organized by the British Photoelectric Spectrometry Group and the Electronics Department of Southampton University. There is a suggestion of inclusiveness in the title, but emission spectroscopists may be disappointed since their endeavors receive little direct attention except in portions of one chapter. Indeed, apparently because of the interests of many who were involved in its preparation, a large part of the book is directed toward those for whom a major concern is infrared spectrometry.

On the dust cover appears this statement: "This book aims at providing a complete course for spectroscopists who wish to learn something about electronics or to brush up their knowledge on the subject." For those who find themselves in the "brush up" category and who wish to become more thoroughly informed about specific topics, there will probably be found much that is helpful and satisfying. However, he who would "learn something about electronics" should first look elsewhere before he will be able to make effective use of the material presented here. Three authors contributed to the first 8 chapters whose topics include alternating current theory, amplifiers, power supplies, and noise. The approach is largely mathematical and would seem to presume some prior knowledge of basic electronics and perhaps a bit of circuit theory. Relatively little appears that could not be found in many other reference works and texts on electronics, but there is an admitted advantage in having this material collected and presented adjacent to other topics of interest to those who make use of the techniques of absorption spectros-

(*Continued on page A920*)

QUALITATIVE ELEMENTAL ANALYSIS

ERNEST H. SWIFT and W. P. SCHAEFER
California Institute of Technology

is a book for freshman and sophomore laboratory courses in qualitative chemistry. It employs the new system of analysis described by the authors in this issue of *Journal of Chemical Education* in the article entitled "A System of Qualitative Elemental Analysis for Instructional Purposes." The system embraces some thirty-two elements, which are divided into the Basic, Amphoteric, and Acidic Groups according to their acid- and base-forming properties. Because these properties can be readily correlated with the electronic structure and periodicity of their elements, this division offers distinct instructional advantages over the major group separations of conventional qualitative schemes. The system has been used for the past eight years with undergraduates at the California Institute of Technology and the University of California, Los Angeles.

1961, approx. 480 pages, $6.75

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☐ INTRODUCTION TO CHEMICAL INSTRUMENTATION

By EDWARD J. BAIR, Indiana University. McGraw-Hill Series in Advanced Chemistry. *Available January, 1962*

An introduction for the experimental chemist to a detailed understanding of the design and operation of chemical instruments. Emphasis is on the flow of signals and the information they represent. Designed for graduate students and research workers, the book covers a representative collection of topics which provide insight into new advances in instrumentation as they appear in chemical literature and into the art of designing instruments for new applications as well.

☐ STATISTICAL MECHANICS

By NORMAN DAVIDSON, California Institute of Technology. McGraw-Hill Series in Advanced Chemistry. *Available January, 1962.*

A text designed for a full year's course in statistical mechanics. The author helps the student gain control of this valuable tool of investigation, its techniques, and its limitations. The treatment is clear, readable and logical, but sufficiently rigorous for introductory or intermediate graduate courses. Careful attention is paid to detail and to mathematical development. A logical development from elementary to advanced theories.

☐ PHYSICAL CHEMISTRY

By GEORGE H. DUFFEY, South Dakota State College. Available January, 1962

This text has been prepared as an introduction to physical chemistry for students who have had calculus and have followed the modern chemical-bond approach in their introductory courses. The theoretical side of physical chemistry is emphasized and only enough descriptive and experimental material is presented to support the arguments and to form exercises in applying the theory.

☐ STEREOCHEMISTRY OF CARBON COMPOUNDS

By ERNEST L. ELIEL, University of Notre Dame. McGraw-Hill Series in Advanced Chemistry. *Available April, 1962.*

Using a sound theoretical approach based on the thermodynamic and kinetic concepts wherever possible, the book develops the essential concepts of stereochemistry on a level appropriate for students at the advanced undergraduate or graduate level. It will be of interest to organic chemists, biochemists, and physical chemists.

☐ NONEQUILIBRIUM THERMODYNAMICS: A Phenomenological Theory of Irreversible Processes in Fluid Systems

By DONALD D. FITTS, University of Pennsylvania. McGraw-Hill Series in Advanced Chemistry. *Available March, 1962.*

The purpose of this unique, advanced graduate textbook is to develop the macroscopic theory for transport processes in fluids—gases, gas mixtures, pure liquids and solutions. It develops the theory from clearly stated postulates and explores the consequences of the theory. The approach is analytical; the coverage is limited to the development of theory with some discussion and analysis of experimental results. Included is significant work which appeared late in 1960.

☐ THEORY OF MOLECULAR EXCITONS

By A. S. DAVYDOV. Translated from the first Russian edition by MICHAEL KASHA, Florida State University; and MAX OPPENHEIMER, JR., State University of Iowa. Available March, 1962.

Translation of a rare Russian book originally published in 1951 under the title, THEORY OF THE ABSORPTION OF LIGHT IN MOLECULAR CRYSTALS, by A. S. Davydov of the Ukranian Academy of Science. The author stresses the resonance interaction of weakly coupled molecular systems. To bring this edition up to date the translators have included two appendices which cover the principal literature on related topics through July, 1959.

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BOOK REVIEWS

copy. Since 10 years elapsed between the initial presentation of the unedited lectures and their appearance in bound form, it is unfortunate that certain chapters could not have been brought up to date in their literature coverage generally, and with some mention of solid-state electronic devices specifically.

A certain amount of useful information is to be found in the chapters entitled The Application of Semiconductors to the Detection of Radiation, Detector and Amplifier Systems in Infrared Spectrometry, Photoelectric Devices and Their Application in the Visible and Ultraviolet Regions, and Some Optical Problems. Two additional chapters are rather specialized: The Presentation of Infrared Spectra on the Cathode Ray Tube, with particular emphasis here being placed on the use of this technique in studying the kinetics of rapid reactions, and Polarized-Beam Techniques in Infrared Spectroscopy and their value, at least in simple cases, in determining approximate bond directions in a molecule.

Each of these six chapters in the latter half of the book is written by a different authority. The disadvantage of multiple authorship is at times apparent in the lack of uniformity of writing style, and in the scope and level of difficulty of the various offerings. In surveying the chapter on Polarized-Beam Techniques the reviewer found himself wishing that the extremely lucid manner of presentation shown there had extended to certain other portions of the book.

To continue in this vein might result in undue captiousness and convey a somewhat misleading impression. "Electronics for Spectroscopists" should prove valuable as a reference work for the serious spectroscopist who wishes to learn more about the topics that are included, and certainly the somewhat less expert spectrometer user who is able to master the material presented will have reasonably thorough and useful grounding in electronics, for application not only to his work in absorption spectroscopy but possibly to other research problems as well. Further, those in education who are responsible for incorporating into the curriculum basic instruction in spectroscopy should find considerable information of help to them.

H. W. Safford
University of Pittsburgh
Pittsburgh, Pennsylvania

Chemical Properties and Identification of Ions: An Introduction to Semimicro Qualitative Analysis

Omer K. Whipple, California State Polytechnic College, San Luis Obispo. Wadsworth Publishing Co., Inc., San Francisco, California, 1961. x + 310 pp. Figs. and tables. 15 × 20 cm. Paperbound. $3.95.

In the preface of this little laboratory book the statement is made that "It is designed particularly for use in the second

(*Continued on page A922*)

JUST PUBLISHED

. . . a general chemistry laboratory manual designed to minimize the "cookbook" nature of the first year chemistry laboratory.

INVESTIGATIONS IN CHEMISTRY

by **Jay E. Taylor,** *Kent State University,* **John R. Demuth,** *University of Nebraska and* **George L. Bush,** *Kent State University*

The unique and most outstanding feature of this manual is the investigative approach. Numerous suggestions give the student excellent opportunity for supervised independent work. Included are more experiments of a quantitative nature than normally found in general chemistry manuals. Experiments dealing with chemical kinetics, equilibrium, solubility product, voltaic cells, conductivity of solutions are original in design and emphasize a high level approach to the understanding of underlying principles. A formal scheme of qualitative analysis outlines laboratory work for those colleges which devote all or part of the second semester of general chemistry to this area of instruction. Suggestions are given for individual student development of a scheme of qualitative analysis. Ideas for a special student project are presented. *1961, 250 pages, $4.25.*

. . . uses quantities of one-tenth of those commonly applied.

ORGANIC CHEMISTRY—LABORATORY EXERCISES

by **James M. Sugihara,** *University of Utah*

This manual meets the needs of chemistry majors, engineers and pre-medical students taking a beginning organic chemistry course. Experiments are described using one-tenth of those commonly applied . . . using conventional equipment but smaller in size. Among the advantages gained are: greater safety in student laboratories, lower replacement cost of broken equipment, use of more expensive chemicals, less time required for completion of experiments and less space required. *1961, 128 pages, $4.00.*

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ABSORPTION SPECTROSCOPY

By Robert P. Bauman, *Polytechnic Institute of Brooklyn.* A comprehensive introduction to postwar theory and practice in absorption spectroscopy, this book covers ultraviolet-visible, infrared, and Raman spectroscopic methods and their applications in qualitative and quantitative analysis and in the determination of molecular structure. It will enable the student with no prior experience in the subject to take advantage of the many valuable specialized monographs and current research articles in the field. The author begins by developing the theory underlying interpretation of spectra and pertinent aspects of classical and quantum mechanics. He then goes on to discuss qualitative analysis by means of electronic and vibrational spectra, quantitative analysis through ideal and non-ideal systems of one or many components, and molecular spectroscopy. Problems are included at the end of each chapter.

1962. Approx. 568 pages. Prob. $10.50

BASIC PRINCIPLES OF THE TRACER METHOD

By C. W. Sheppard, *University of Tennessee Medical Units.* This monograph brings together and formulates for the first time the basic principles of tracer kinetic theory and analysis. The author's aim is to show the student the scope and limitations of the tracer method—particularly, with respect to its applications in physics, chemistry, and physiology. He also discusses what may be expected to occur in a kinetic system following the introduction of labelled material into a part of it. Theoretical material is necessarily presented in mathematical terms, but in such a way that students without an extensive background in mathematics can follow the analysis. Special attention is given to modern methods of applied mathematics, including numerical analysis with digital computers and analog simulation procedures. A valuable and extensive bibliography appears at the end of the book.

1962. Approx. 275 pages. Prob. $8.00

DYNAMIC PHYSICAL CHEMISTRY

By J. Rose, *Birkenhead Technical College, Great Britain.* Designed to serve as either an introduction or a reference to modern physical chemistry, this book is a clear, easy-to-follow guide to the many important recent advances in the field. One of the major features of the book is the attention it devotes to special subjects which are now becoming important, e.g., reactions in the solid state and at elevated temperatures, radiochemical kinetics, and the Principle of Caratheodory. In addition, there are extensive treatments of thermal kinetics, photochemistry, phase rule, and thermodynamics. Quantum theory is introduced by describing the experimental basis of the concept, and both the "old" and the "new" theories are discussed with special reference to the periodic classification and bonding.

1961. In press.

BIOCHEMICAL MECHANISMS

By Lloyd L. Ingraham, *University of California, Davis,* Biochemistry has now reached a stage of development that requires a knowledge of mechanistic chemical principles. Although there are several books which contain background material on these principles, this book is the first to fill the special needs of biochemists in this area. Part I of the book presents the general mechanistic principles of organic and inorganic chemistry that are of value in biochemistry. It includes a review of orbital and other fairly basic concepts in order to facilitate the discussion of mechanisms in the second section of the book. Part II treats specific biochemical mechanisms, and is divided into discussions of various types of reactions. The mechanism as known in solution chemistry is discussed in terms of principles that are applicable to the biochemical reaction. Next, the mechanisms of action of any model enzyme are described, and finally the enzymic reaction is compared with model reactions. *1962. Approx. 112 pages. Prob. $4.75*

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term of the first year chemistry course," and the book seems to meet this design adequately.

The first two chapters involve some discussion of chemical reactions, contrasting molecular with ionic reactions, and equation writing of various types with emphasis on those involving oxidation-reduction. Semimicro equipment, materials, and techniques are rather nicely discussed.

The anion groups are divided into three types, the chloride group, the sulfide group, and the nitrate group. There are 14 anions involved.

There is an adequate general discussion of the standard division of cation groups, i.e., sodium-calcium, iron-aluminum, copper-tin, and silver. A short coverage is given to the solvent action of water on electrolytes, but there is a good development of K_{sp} and the ion product. Many excellent problems illustrate the concepts involved.

In the experimental section on cations, the groups are somewhat abridged in the interest of economy of laboratory time. For instance, strontium is omitted from the sodium-calcium group, cobalt is omitted from the iron-aluminum group, and bismuth, arsenic, and mercury II are omitted from the copper-tin group. There is an adequate discussion of complex ions and instability constants again with appropriate examples of various calculations.

Each chapter is followed by a sufficient number of problems so that considerable selection by the teacher is available. Answers are given to the mathematical questions.

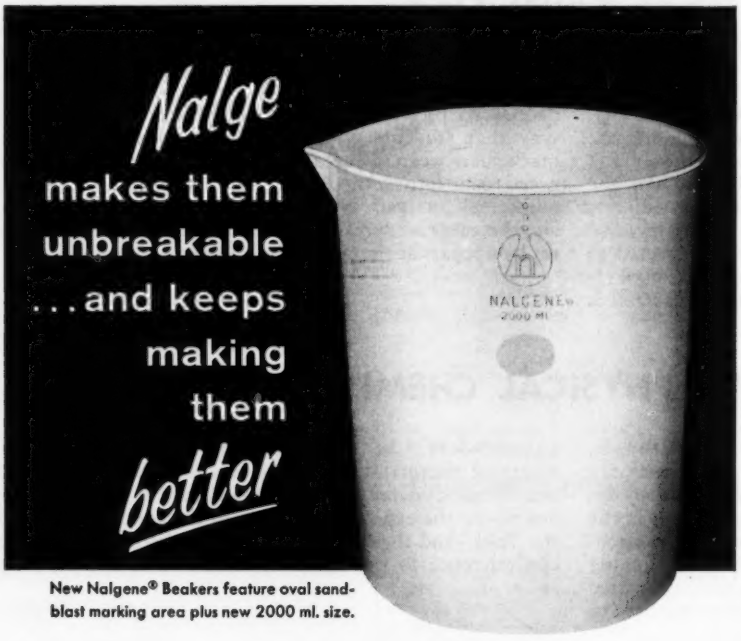
After the experimental work on each individual anion or cation is completed, directions and a known solution of the entire group is provided along with a well-done flow sheet for that particular group. After the student has reported his results on a specially designed report form for the known solution, he is given an unknown solution with instructions to devise his own method of analysis and to take advantage of any short cuts which he may deem advisable. Again a special report form is provided.

With the emphasis that the author puts on oxidation-reduction in a qualitative manner, it seems peculiar that no mention is made of oxidation potentials. Such an inclusion might enhance the understanding that the student could obtain from the use of this book.

In the various appendices there are given suggestions for recording laboratory observations, lists of student locker equipment, lists of student and general reagents, a time saving section on the preparation of solutions, directions for issuing and reporting unknown solutions, and a table of four place logarithms.

All in all, the book is well written, explicit, and useful in providing an adequate second semester laboratory experience for general chemistry students.

DONALD B. SUMMERS
Olin Mathieson Visiting
Chemistry Teacher
Alton Senior High School
Alton, Illinois



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Properties and Structure of Polymers

A. V. Tobolsky, Princeton University, Princeton, New Jersey. John Wiley & Sons, Inc., New York, 1960. x + 331 pp. Figs. and tables. 16 × 23.5 cm. $14.50.

This book provides information for the specialist or for the physical chemist or physicist who has an active interest in the specific concepts discussed. The subjects of elasticity and viscosity, polymer physics, linear viscoelasticity, viscoelastic behavior, chemical stress relaxation and polymerization equilibria are discussed and treated mathematically in an admirable manner. Several physical concepts are discussed briefly under the subject of "polymer physics." Among these are the conformation of a linear chain, amorphous and crystalline polymers, thermodynamics and kinetics of crystallization, the glass transition temperature, regions of viscoelastic behavior, modulus-temperature curves, flow viscosity of linear amorphous polymers, and the kinetic theory of rubber elasticity.

The book is written predominantly as a treatment of polymers having properties which permit them to fit into the area of elastomers, rather than from the standpoint of polymers in general. The major portion of the illustrative material is taken from that group which are predominantly useful as elastomers. While the author has given adequate reference material and, in many cases, as he points out in the preface, citation to the original experimental work has been made, many topics of extreme importance to properties and struc-

BOOK REVIEWS

tures of polymers have not been referred to at all, or have been mentioned only briefly. Among these are chemical bonds and molecular forces, infrared methods of determination of chemical structure of polymers, thermal stability of polymers, effects of degree of crystallinity and molecular weight on tensile strength, relationship of polymer properties for plastic, fiber or elastomer application, steric hindrance in polymer chains, the theory of gelation, properties of polyelectrolytes, properties of proteins, and cellulosic materials.

The author points out in the preface that "only selected topics could be treated in a book of modest size, and the choices were naturally guided by my own research experiences." His interests in viscoelasticity have predominated in his thinking, and many of the other physical concepts discussed have been used as supporting data for the major topic of viscoelastic behavior. The only criticism of this book can be that the title is too broad rather than that the subject matter treatment is inadequate. As pointed out above, the theoretical and mathematical treatment of the chosen subject matter have been done in an excellent manner.

GEORGE B. BUTLER
University of Florida
Gainesville

The Use of Organic Reagents in Inorganic Analysis

A. I. Busev and *N. G. Polianskii*. Translated from the Russian by *J. T. Greaves*. Pergamon Press, Inc., New York, 1960. viii + 76 pp. 14.5 × 22 cm. $3.50.

This short monograph, an English translation of the original Russian text, should prove quite useful to chemists in this country. The first section of this book treats the problems one encounters in the application of organic reagents. Short abstracts of theoretical studies of complex formation are presented in this section. The second portion of the text gives, according to a periodic group classification, methods of determining many of the elements using organic reagents.

Most of the references in this text cover the years from 1953 through 1955. This limitation prevents any critical treatment of organic reagents such as that presented in references by Welcher or Feigl. The translation is not well written, but nevertheless the material will be useful in the study of organic reagents.

An attractive feature of this text is the incorporation of material from Russian journals. The English translations of all the original articles are available from the publisher. These factors should enhance the usefulness of this monograph.

THEODORE R. WILLIAMS
College of Wooster
Wooster, Ohio

Toxicology: Mechanisms and Analytical Methods. Volume 1

Edited by *C P. Stewart*, University of Edinburgh, Scotland and *A. Stolman*, Connecticut State Department of Health, Hartford. Academic Press, Inc., New York, 1960. xvii + 774 pp. Figs. and tables. 16.5 × 23.5 cm. $22.

The scope of toxicology in this book is largely forensic; the mechanisms are to a large extent those of drugs, and the analytical methods relate to body tissues and excreta.

Toxicology, which in the older and stricter view might be considered as the science of poisons, rather today is in reality a science devoted to the determination for *any material* under what conditions it is either safe or beneficial. This concept is utilized in research in establishing limits of safety, control of the environment, the surveillance of man as related to industrial exposure, air and water pollution. This concept applies equally to the foods eaten by the general public, to drug action, to forensic medicine, etc. Since the present day pursuit of this field of knowledge, as many others, involves the use of many disciplines, it is reasonably understandable why no one author nor any group has attempted to provide a series of related comprehensive books pertaining to the toxicological facts, *per se*, as well as the knowledge and techniques as applied by the numerous disciplines. It is unfortunate that a book as well written and as authoritative in its particular aspect of toxicology unwittingly leaves the impression that its phase is either the only or the major portion of toxicology.

One will not find here elaboration of such basic toxicological concepts as dosage-response, tolerance, poison, safety, or hazard. Toxicological facts, *per se*, symptomatology and pathology are considered only slightly or not at all.

The authors correctly call attention to the fact that upon inhalation of a gas or vapor that the time required for saturation (equilibrium) of the body by a nonreactive material is inversely related to the solubility. However, they do not make it clear that the concentration in the blood at equilibrium is unrelated to solubility but rather related to the distribution coefficient between the blood and the alveolar air. Although valuable blood levels are related to clinical conditions, the concentrations inhaled and times to attain such levels generally are not reported.

This book explains well the principles of the method of analysis, although, at times the discussions are a little meager. For example, the infrared instrumentation presents an optical diagram of a typical spectrometer which has been supplanted by more up-to-date instruments. It is our opinion that section VII (page 338), Gas Chromatography, was sadly neglected. However, the other fields of interest and remaining discussions, while brief, may be adequate for a worker who wishes to familiarize himself with the general principles of analysis. The refer-

(*Continued on page A924*)

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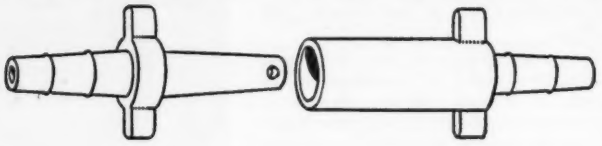

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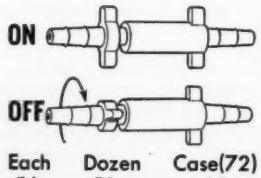

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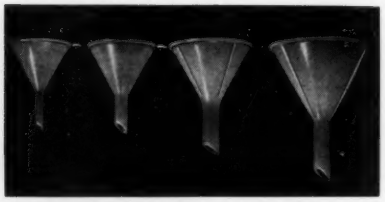

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ences are complete and contain many of the well known applicable publications.

Although it excludes many compounds from the sections relating to the fate of material, the book brings together considerable important information relating to fate of materials, with emphasis on drugs, on levels of compounds in blood, tissues, respired air, and urine. The fate of insecticides is given brief attention. The recent excellent series of studies by Gerade on the fate of aromatic hydrocarbons are conspicuous by their absence but this is probably due to time required to produce such a book.

In general, the editors have accomplished their purpose since it presents excellent material and references from the standpoint of forensic toxicology and toxicological analysis. We believe this book will become a valuable addition to the practicing professional toxicologists, and clinical chemists who are confronted with "what method of separation, of qualitative identification and estimation is best suited for the problem."

JOSEPH F. TREON and
CHARLES F. SMULLIN
Atlas Chemical Industries, Inc.
Wilmington, Delaware

Progress in Inorganic Chemistry. Volume 2

Edited by *F. Albert Cotton*, Massachusetts Institue of Technology, Cambridge. Interscience Publishers, Inc., New York, 1960. x + 399 pp. Figs. and tables. 16 × 23.5 cm. $10.50.

The second volume in this series consists of seven chapters. These range in scope from strictly theoretical discussions to essentially descriptive summaries of subjects which are currently engaging the interests of inorganic chemists.

The first chapter, on "Radioactivation Analysis in Inorganic Chemistry" by J. W. Winchester, is concerned with problems such as chemical dating and terrestial composition. This review examines critically the reliability and sensitivity of several analytical methods, with particular emphasis on the excellence of that method based on neutron activation. Extensive tables are provided giving the abundance of elements in silicate rocks, etc. R. M. Diamond and D. C. Tuck, in a second chapter, present a comprehensive and critical review covering the "Extraction of Inorganic Compounds into Organic Solvents." In the opinion of this reviewer, the subject is presented in a most excellent fashion, both theoretically and topically. Obviously, the practical applications of this method are becoming increasingly more important. In a third chapter C. J. Ballhausen considers the "Intensities of Spectral Bands in Transition Metal Complexes." While the presentation is excellent, this reviewer feels that a more comprehensive treatment with

(Continued on page A926)

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(1) Ind. Eng. Chem. 26–653 (June, 1933)

(2) Ind. Eng. Chem. 25–1112 (Oct., 1933)

(3) National Bureau of Standards Journal of Research 12-241 (Feb. 1934, R.P. No. 649)

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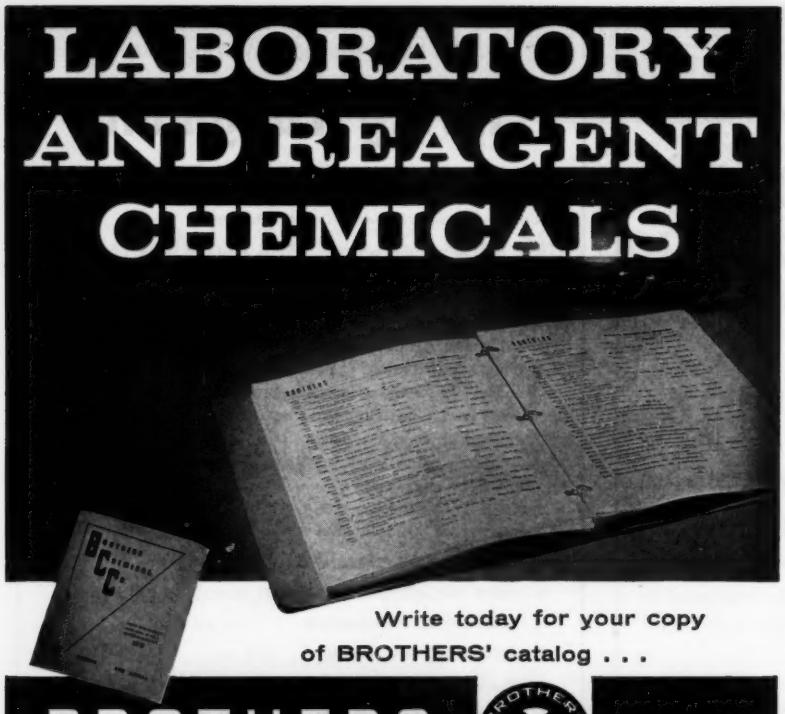

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NORBERT A. LANGE, Marion Cleaveland Lange
Journal of Chemical Education, March, 1958

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BOOK REVIEWS

applications would be most welcome in a series such as this.

The four remaining chapters are devoted, primarily, to descriptive chemistry, but a discussion of structures and the application of physical principles are not neglected. These are: "Halides and Oxyhalides of the Elements of Groups Vb and VIb" by John W. George; "Some Fluorine Compounds of the Transition Metals" by R. D. Peacock; "Unusual Oxidation States of Some Actinide and Lanthanide Elements" by L. B. Aeprey and B. B. Cunningham, and "Metal Alkoxides" by D. C. Bradley. The review on fluorine compounds by Peacock is notable in that it includes a section on preparative methods and techniques.

In view of the rapidly expanding areas in inorganic chemistry it is becoming increasingly apparent to all that it is impossible to keep abreast with modern developments by merely making a casual survey of the literature. Accordingly critical reviews such as these are becoming more and more important. All persons interested in developments in inorganic chemistry should have access to these collected works.

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Edited by *Arthur Osol*, Philadelphia College of Pharmacy and Science, Philadelphia, Pennsylvania and *Robertson Pratt*, University of California School of Pharmacy. J. B. Lippincott Co., Philadelphia, Pennsylvania, 1960. 1960 ed. vii + 240 pp. 18 × 26.5 cm. $9.

This volume is a welcome addition to the pharmacists' and chemists' shelf as well as to the teachers' library. The purpose of this volume is to bring the U.S.D. 25 up to date with respect to the U.S.P. XVI, N.F. XI, B.P. 1958, and the International Pharmacopoeia. In addition to containing 209 completely new monographs, the supplement also contains survey articles on various categories of medicinals such as Antibiotics, Antibiotics with Antitumor Activity, Hypoglycemic Sulfonylureas and Biguanides, Psychotherapeutic and Psychotomimetic drugs, and Saluretic Agents. Extensive information is also presented on the manufacture and standardization of antibiotics. The authors have continued to concentrate on the actions, uses, doses, and side effects of the drugs discussed.

This reference work is a necessary source of information for the chemist as well as for the pharmacist.

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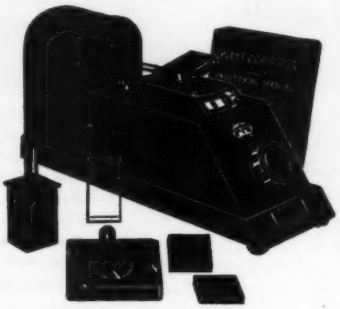

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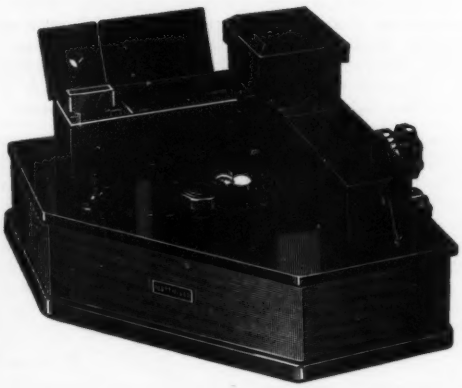

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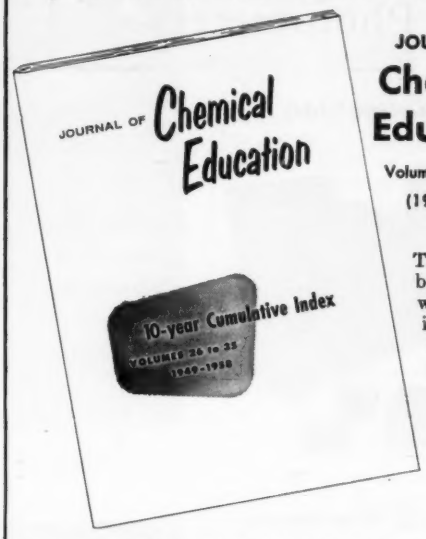

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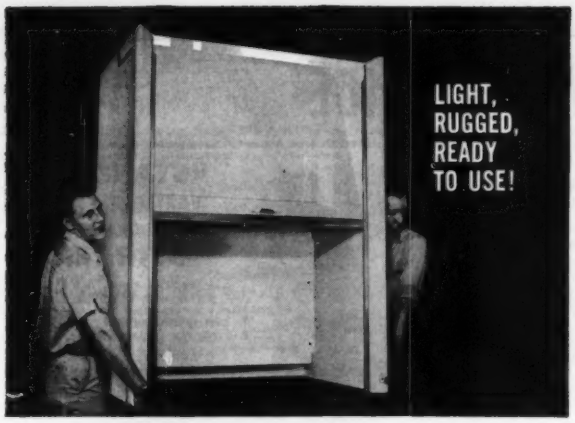

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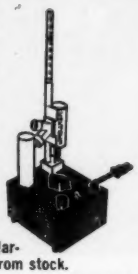

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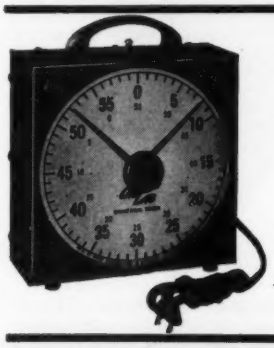

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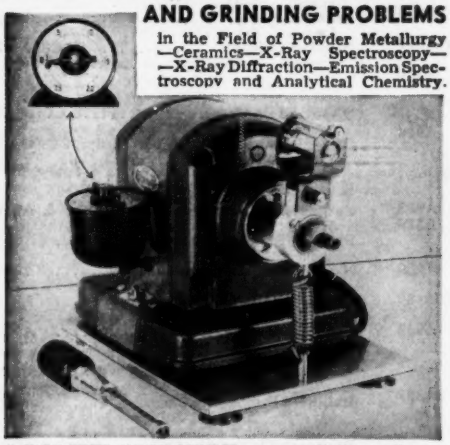

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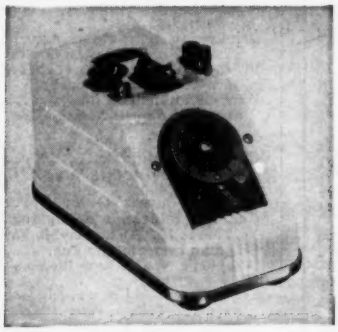

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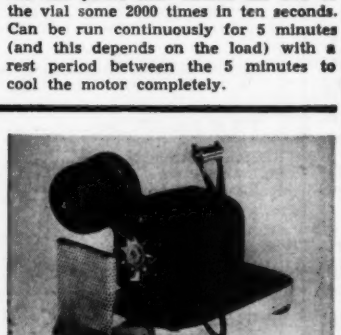

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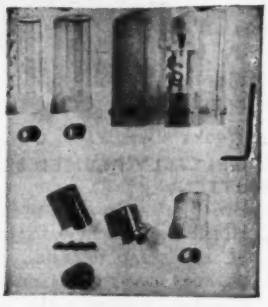

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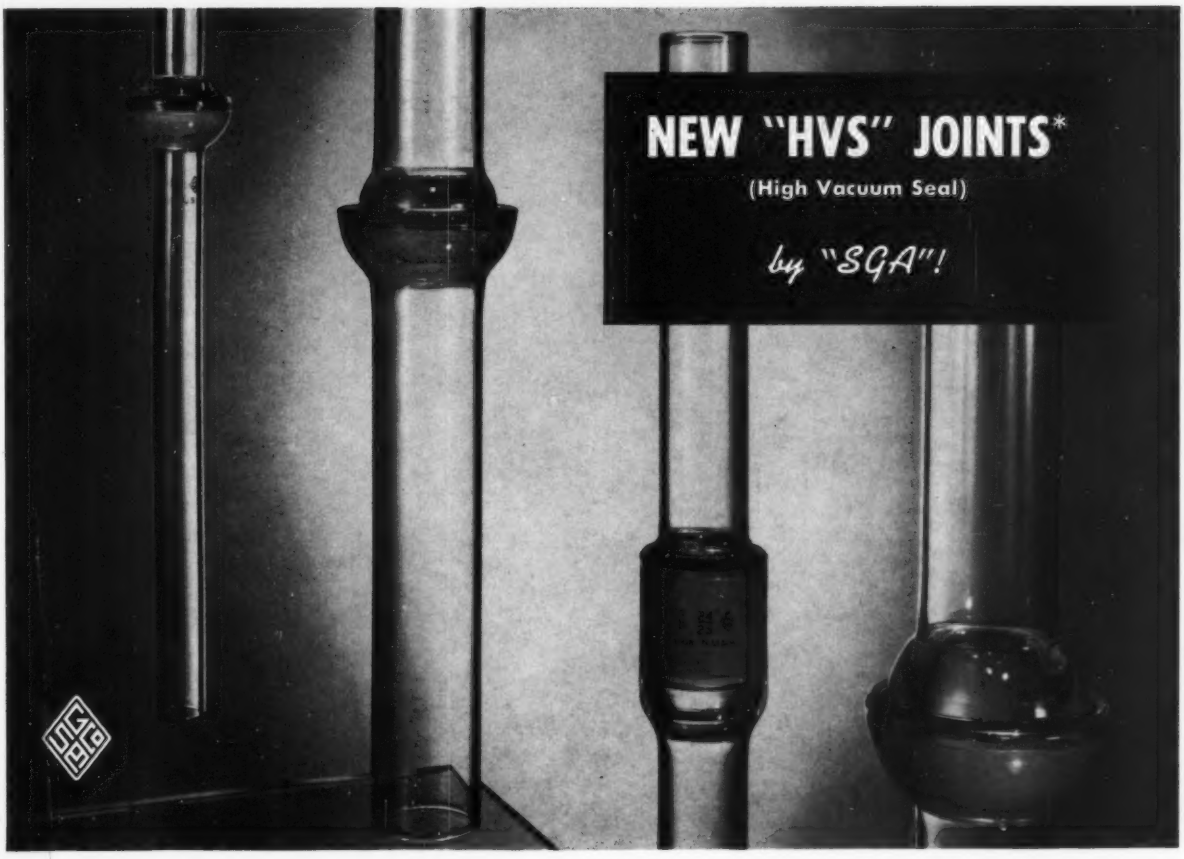

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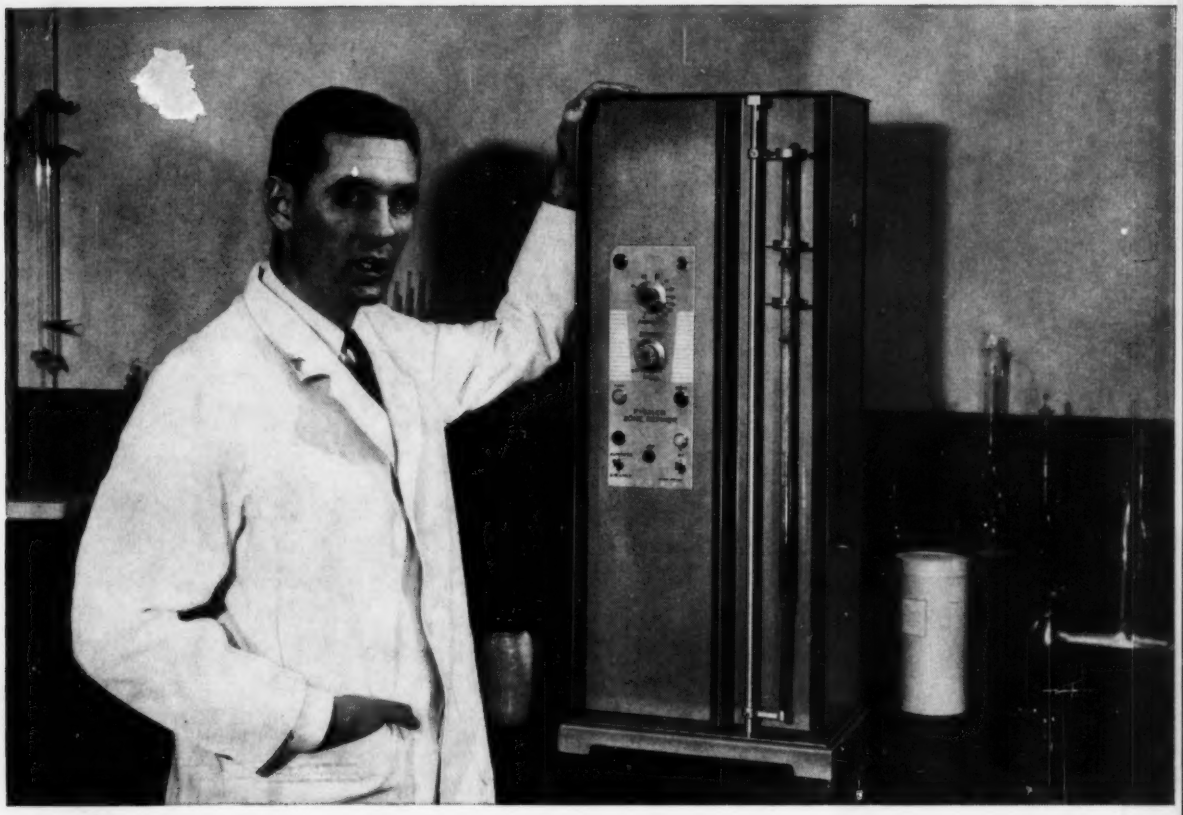

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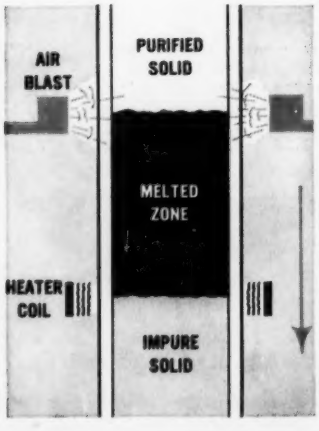

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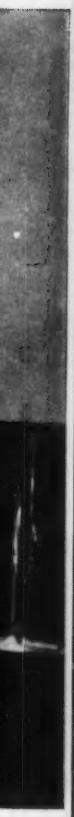

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